Claims

1. (currently amended) A surgically implantable biarticular disk designed to replace a CMC joint, which implant comprises:

an integral disk which is circular in plan view and has a pair of convex spherical articular surfaces, each of which is a section of a sphere, and an axial, flaring hole which extends therethrough from articular surface to articular surface to accommodate a flexible cord that is passed through passageways in the metacarpus and the trapezium or other carpal bone, said convex spherical articular surfaces being interconnected at their peripheries by a curved rim surface which is a segment of a spheroid, which disk is a graphite core coated with wear-resistant ~~pyrocarbon and~~ pyrocarbon and, once surgically implanted in space created by resecting the base of the metacarpus and the distal surface of the trapezium to provide two concave spherical surfaces, allows the metacarpus to flex relative to the trapezium or other carpal bone enough for useful hand function, with each bone sliding on the respective mating convex solid nonflexible articular surface of the disk while the flexible cord conforms to the flaring surface of the axial hole in the plane of flexion.

2. (previously presented) The implant of claim 1 wherein said axial flaring opening is a section of a torus.

3. (previously presented) The implant of claim 2 wherein said torus has a radius of curvature which is about 15% to about 30% less than the height of said disk.

4. (previously presented) The implant of claim 2 wherein the radius of curvature of transition surfaces between said toroidal surface and said convex spherical surfaces is between about 0.7 and about 3 mm.

5. (previously presented) The implant of claim 1 wherein the radii of curvature of said pair of convex spherical surfaces are the same.

6. (previously presented) The implant of claim 5 wherein said radius of curvature of each said convex spherical surface is at least about twice the radius of said circular disk and wherein said peripheral rim surface is a segment of a sphere.

7. (previously presented) A method of repairing a deteriorated CMC joint of the thumb, which method comprises:

resecting the base of the metacarpus and the distal surface of the trapezium to provide concave articular surfaces which match the convex articular surfaces of the disk of claim 1, creating passageways in the metacarpus and the trapezium opening into said resected concave articular surfaces, and surgically implanting the implant of claim 1.

8. (original) The method of claim 7 which includes the step of selecting said implant to be implanted from a set of said implants of different sizes but all having substantially the same radius of curvature of said convex surfaces.

9. (currently amended) A surgically implantable biarticular disk designed to replace a CMC or TMT joint, which implant comprises:

an integral circular disk having a pair of convex spherical articular surfaces, each of which is a section of a sphere, and an axial, flaring opening which extends therethrough from convex articular surface to convex articular surface to accommodate a flexible cord that is passed through passageways created in the proximal bone of the digitus and in the trapezium or other carpal or tarsal bone, said convex spherical articular surfaces being interconnected at their peripheries by a curved rim surface which is a segment of a spheroid, which disk has a modulus of elasticity similar to cortical ~~bone and~~ bone and, once surgically implanted in space created between two resected articular bone surfaces, allows said proximal bone to flex relative to said other bone enough for useful hand or foot function, with each bone sliding on the respective mating convex solid nonflexible articular surface of the disk while the flexible cord conforms to the flaring surface of the axial hole in the plane of flexion.

10. (previously presented) The implant of claim 9 wherein said axial flaring opening is a section of a torus.

11. (previously presented) The implant of claim 10 wherein said torus has a radius of curvature which is about 15% to about 30% less than the height of said disk.

12. (previously presented) The implant of claim 10 wherein transition surfaces between surfaces of said torus and said convex spherical surfaces have a radius of curvature between about 0.7 and about 3 mm.

13. (previously presented) The implant of claim 9 wherein the radii of curvature of said pair of convex spherical surfaces are the same and wherein said peripheral rim surface is a segment of a sphere.

14. (previously presented) The implant of claim 13 wherein said radius of curvature of each said convex spherical surface is at least about twice the radius of said circular disk.

15. (previously presented) A method of repairing a deteriorated CMC or TMT joint which method comprises: resecting the base of the proximal bone of the digitus and the distal surface of the carpal or tarsal bone to provide concave articular surfaces which match the convex articular surfaces of the disk of claim 9, creating passageways respectively in said bones which open into said resected concave articular surfaces, and surgically implanting the biarticular disk of claim 9.

16. (currently amended) A method of repairing a deteriorated CMC joint of the thumb, which method comprises:

resecting the base of the metacarpus and the distal surface of the trapezium to provide concave articular surfaces of similar spherical curvature, and creating passageways in the metacarpus and the trapezium which will open into said resected concave surfaces,

providing a circular disk of solid nonflexible material having a pair of convex spherical articular surfaces of the same spherical curvature as said resected articular surfaces and an axial, flaring hole which extends therethrough from surface to surface to accommodate a flexible cord, said convex spherical articular surfaces being interconnected at their peripheries by a curved rim surface which is a segment of a spheroid, and

surgically implanting said disk, which disk once surgically implanted allows the metacarpus to flex relative to the trapezium, as each resected concave articular surface slides on the respective convex solid nonflexible articular surface of said disk, enough for useful hand function.

17. (previously presented) The method of claim 16 which includes the step of selecting said disk to be implanted from a set of disks of different sizes but all having substantially the same radius of curvature of said convex surfaces.

18. (previously presented) The method of claim 16, which includes the step of passing a flexible cord through the passageway created in the metacarpus, the flaring axial opening and the passageway created in the trapezium so that the flexible cord conforms to the flaring surface of the axial hole in the plane of flexion when each bone slides on the respective mating convex surface of the disk.

19. (previously presented) The method of claim 18 wherein said flexible chord is a harvested tendon.

20. (previously presented) The method of claim 19 wherein said tendon is harvested from the vicinity of the CMC joint where it remains attached and the free end is passed through said passageways and tied off or knotted.